WHAT IS CLAIMED AS NEW AND DESIRED TO BE SECURED BY LETTERS PATENTS OF THE UNITED STATES IS:

1. A method for the analysis and/or monitoring of the partial discharge behavior of an electrical operating means, in particular in terms of its development over time, appropriate partial discharge data being recorded in processing state matrices (1), in which the amplitude (7) of a partial discharge, its phase angle (6) and its frequency of occurrence is depicted in each case in a matrix element (5) of the process state matrix (1), and in that
at a first time, a partial discharge process state is registered in a first process state matrix (2) and, at a later time, a further partial discharge process state is registered in a further process state matrix (3), and in that
for the purpose of analysis and/or monitoring, the first (2) and the second (3) process state matrix are compared with the aid of comparison and scaling methods.

2. The method as claimed in claim 1, characterized in that, in each case in a matrix element (5) of the process state matrix (1), the amplitude (7) of a partial discharge is depicted as a function of the phase angle (6), each matrix element (5) additionally being assigned an associated frequency of occurrence.

3. The method as claimed in either of claims 1 and 2, characterized in that, in each case from the process state matrices (2, 3), first of all state parameters (Z_n), in particular scaled state parameters (Z_n), are determined and these state parameters (Z_n) are

compared for the purpose of analysis and/or monitoring of the states of the insulation.

4. The method as claimed in claim 3, characterized in that the variation over time of the state parameters (Z_n) determined from various further process state matrices (3) is used for the assessment of the change over time or for the prognosis of the further change over time of the partial discharge behavior.

5. The method as claimed in one of the preceding claims, characterized in that the individual matrix elements (5) experience different weighting and/or scaling, depending on the amplitude (7) or depending on the phase angle (6) or depending on the frequency of occurrence, before they are supplied to the comparison and scaling method.

6. The method as claimed in one of the preceding claims, characterized in that the comparison method comprises a step in which similarity values are formed, which reproduce the difference between the process state matrices (2, 3), the process state matrices (2, 3) preferably being visualized in a representation of the amplitudes (7) as a function of the phase angle (6) and in an encoding of each such pixel as a function of the frequency of occurrence.

7. The method as claimed in one of the preceding claims, characterized in that, in the process state matrices (2, 3), in particular adjacently arranged matrix elements (5) are combined in discrete windows (4), and in that the matrix elements of the process state matrices (2, 3) of a window (4) are in each case averaged and/or scaled together before they are

supplied to the comparison method, the windows in particular preferably being defined in the plane covered by phase angles (6) and amplitudes (7).

8. The method as claimed in claim 7, characterized in that the contents of corresponding windows (4) of different process state matrices (2, 3) are compared, and in that different windows (4) in a process state matrix are weighted and/or scaled differently.

9. The method as claimed in either of claims 6 and 7, characterized in that, in the process state matrices (2,3), in particular adjacently arranged matrix elements (5) in discrete regions (9, 10) of interest are combined, and in that in particular different discrete regions of interest (9, 10) are preferably scaled and/or weighted differently in the comparison method, the regions (9, 10) of interest in particular preferably being defined in the plane covered by phase angles (6) and amplitudes (7).

10. The method as claimed in claim 9, characterized in that the discrete regions (9, 10) of interest are divided up into discrete windows (4), and in that the contents of windows (4) of identical regions (9, 10), if appropriate following averaging of the matrix elements of the respective window (4), are treated equally in the comparison method.

11. The method as claimed in either of claims 9 and 10, characterized in that state changes obtained from the comparisons of the state parameters obtained from regions (9, 10) of interest are linked mathematically in order to obtain a desired number of state parameters.

12. The method as claimed in one of claims 9, 10 or 11, characterized in that state changes obtained from the comparisons of the state parameters obtained from regions (9, 10) of interest are linked mathematically with at least one state parameter obtained from regions judged to be not of interest, in order to obtain a desired number of state parameters.

13. An apparatus for implementing the method as claimed in one of claims 1 to 12.